Claims

We claim:

1. – 7. (CANCELLED)

8. (NEW) A method for converting heat to useable mechanical energy and/or electrical energy by continuously and concurrently generating a super-ambient temperature heat source and a sub-ambient temperature heat sink, whose temperature differential is sufficient to develop and sustain a heat flow capable of fueling the operation of an incorporated heat engine, within a thermal power plant, one which recycles much of its own waste heat, without utilizing an external heat sink, also said sub-ambient temperature heat sink captures for reuse much of the waste heat rejected by said incorporated heat engine, further said sub-ambient temperature heat sink has a temperature sufficiently low enough to extract replenishment heat from an external environmental heat source, or sources, sufficient to fuel the operation of said thermal power plant, comprising the steps of:

a. flowing in a conjoined flow circuit, a volatile, sub-cooled, ambient temperature, ambient pressure, liquid stream of a cfc working fluid, separates within a cfc flow divider, into two unequal streams, while passing through an ambient conditions datum, at a point common to said conjoined flow circuit, a motive flow circuit, a suction flow circuit, and a cfd fluid import/export device which provides fluid communication between said conjoined flow circuit and a cfc safety/service device, which

is interposed between said cfd fluid import/export device and an sfc shrd-ssths fluid transfer device;

b. leading a greater stream of said two unequal streams leaving said cfc flow divider to an mfc fluid transfer device in said motive flow circuit;

c. pressurizing, at substantially constant entropy, said greater stream has both its pressure and temperature elevated to super-ambient values, thus increasing the specific enthalpy of an mfc working fluid of said greater stream;

d. leading said greater stream leaving said mfc fluid transfer device to an mfc fluid filtering device;

e. filtering, said greater stream has suspended particulate matter removed as it flows through said mfc fluid filtering device;

f. leading said greater stream leaving said mfc fluid filtering device to an mfc fluid flow-regulating device;

g. regulating the flow of said greater stream, said mfc fluid flow-regulating device automatically acts to maintain an adjustable, substantially constant fluid flow, within said motive flow circuit;

h. leading said greater stream leaving said mfc fluid flow-regulating device to a cfc sub-ambient pressure generating device within said conjoined flow circuit;

i. entering said cfc sub-ambient pressure generating device via a cspgd motive flow inlet;

j. leading said greater stream leaving said cspgd motive flow inlet to a cspgd conjoined flow discharge, in so doing said greater stream will expand, at substantially constant entropy, decreasing its pressure energy or head and/or specific enthalpy, and utilizing the pressure energy and/or specific enthalpy given up by said greater stream, to lead the vapor of said lesser stream, supplied via a cspgd suction flow inlet to said cfc conjoined flow discharge, and consequently, to increase the pressure energy or head of the vapor of said lesser stream, by compressing said lesser stream, at substantially constant entropy, such that the sub-ambient pressure vapor supplied by said lesser stream condenses, thoroughly mixing together with said greater stream, distributing much of said lesser stream's latent heat of vaporization to said greater stream, to form a super-ambient pressure, super-ambient temperature liquid, or low quality saturated mixture, thus said cfc sub-ambient pressure generating device combines an mfc working fluid liquid flow with an sfc working fluid vapor flow to produce a cfc working fluid liquid flow, or low quality saturated mixture flow, heated effluent;

k. leading said cfc working fluid liquid flow, or low quality saturated mixture flow, heated effluent leaving said cspgd conjoined flow discharge to a cfc super-ambient temperature heat source;

l. flowing within said cfc super-ambient temperature heat source, said cfc working fluid liquid flow, or low quality saturated mixture flow, heated effluent supplies heat to an incorporated heat engine flow circuit, via one,

or more, indirect heat transfer devices, substantially cooling the working fluid, while simultaneously, decreasing its pressure, at substantially constant entropy;

m. leading the substantially cooled, ambient temperature liquid of said cfc working fluid leaving said cfc super-ambient temperature heat source to said cfc flow divider, thus said cfc working fluid is returned to said ambient conditions datum;

n. leading a lesser stream of said two unequal streams leaving said cfc flow divider to an sfc fluid flow-regulating device;

o. regulating the flow of said lesser stream, said sfc fluid flow-regulating device automatically acts to maintain an adjustable, substantially constant fluid flow, within said suction flow circuit;

p. leading said lesser stream leaving said sfc fluid flow-regulating device to an sfc sfc-hsfc heat recycling heat transfer device;

q. flowing through said sfc sfc-hsfc heat recycling heat transfer device, said lesser stream rejects excess sensible heat to a heat source flow circuit, thus lowering the temperature of an sfc working fluid, while simultaneously, decreasing its pressure, at substantially constant entropy;

r. leading said lesser stream leaving said sfc sfc-hsfc heat recycling heat transfer device to said sfc shrd-ssths fluid transfer device;

s. entering said sfc shrd-ssths fluid transfer device via an ssftd sfc working fluid inlet;

t. leading said lesser stream leaving said ssftd sfc working fluid inlet to an ssftd working fluid discharge, in so doing said lesser stream will expand, at substantially constant entropy, decreasing its pressure energy or head and/or specific enthalpy, and utilizing the pressure energy and/or specific enthalpy given up by said lesser stream, to lead the excess liquid of an shrd working fluid, supplied via an ssftd shrd excess working fluid inlet to said ssftd working fluid discharge, and consequently, to increase the pressure energy or head of said shrd working fluid, by pressurizing said shrd working fluid, at substantially constant entropy, such that the sub-ambient pressure liquid, supplied by said ssftd shrd excess working fluid inlet, thoroughly mixes together with said lesser stream, to form a sub-ambient pressure, sub-ambient temperature, low quality saturated mixture, marginally above the freezing point of an ssftd working fluid discharged from said ssftd working fluid discharge, thus said sfc shrd-ssths fluid transfer device combines an sfc working fluid liquid flow with an shrd excess working fluid liquid flow to produce a secondary saturated mixture;

u. leading said secondary saturated mixture leaving said ssftd working fluid discharge to an sfc sub-ambient temperature heat sink;

v. flowing within said sfc sub-ambient temperature heat sink, said secondary saturated mixture, absorbs heat from said incorporated heat engine flow circuit, at substantially constant temperature, via one, or more, indirect heat transfer devices, and as it does so the quality of said secondary saturated mixture increases;

w. exiting the heat exchange passages of said ssths ihefc-sfc evaporative heat transfer device of said sfc sub-ambient temperature heat sink, said secondary saturated mixture separates into a secondary vapor component and a secondary liquid component;

x. leading said secondary vapor component leaving said ssths ihefc-sfc evaporative heat transfer device to an ssths ihefc-sfc evaporative heat transfer device pressure-regulating device;

y. regulating the internal pressure of said ssths ihefc-sfc evaporative heat transfer device, said ssths ihefc-sfc evaporative heat transfer device pressure-regulating device automatically acts to maintain an adjustable, substantially constant pressure, which also effectively maintains the internal temperature, at a substantially constant, sub-ambient value;

z. leading said secondary vapor component leaving said ssths ihefc-sfc evaporative heat transfer device pressure-regulating device to an sfc heat replenishment device;

aa. leading said secondary liquid component leaving said ssths ihefc-sfc evaporative heat transfer device to said sfc heat replenishment device;

ab. flowing within an shrd hsfc-sfc evaporative heat transfer device of said sfc heat replenishment device, the sub-ambient temperature, sub-ambient pressure, saturated liquid of said secondary liquid component, discharged from said sfc sub-ambient temperature heat sink, absorbs heat from said heat source flow circuit, at a substantially constant temperature, via one, or more, indirect heat transfer devices, and as it does so, a portion of said

secondary liquid component evaporates, thus producing a tertiary saturated mixture;

ac. exiting the heat exchange passages of said shrd hsfc-sfc evaporative heat transfer device of said sfc heat replenishment device, said tertiary saturated mixture, separates to produce a tertiary vapor component and a tertiary liquid component;

ad. leading the excess liquid of said tertiary liquid component leaving said sfc heat replenishment device to said sfc shrd-ssths fluid transfer device;

ae. entering said sfc shrd-ssths fluid transfer device via an ssftd shrd excess working fluid inlet;

af. combining at the discharge of said shrd hsfc-sfc evaporative heat transfer device of said sfc heat replenishment device, said secondary vapor component and said tertiary vapor component, thoroughly mix together, to produce a homogeneous vapor, thus reforming said lesser stream, as a sub-ambient pressure vapor, marginally above the saturation temperature for the internal pressure of the heat transfer device;

ag. leading said homogenous vapor leaving said shrd hsfc-sfc evaporative heat transfer device to an shrd hsfc-sfc super-heat heat transfer device;

ah. flowing through said shrd hsfc-sfc super-heat heat transfer device, said homogeneous vapor, absorbs heat from said heat source flow circuit, via one, or more indirect heat transfer devices, and as it does so the temperature of said homogeneous vapor increases;

ai. leading said homogenous vapor leaving said shrd hsfc-sfc super-heat heat transfer device to a shrd hsfc-sfc evaporative heat transfer device pressure-regulating device;

aj. regulating the internal pressure of said shrd hsfc-sfc evaporative heat transfer device, said shrd hsfc-sfc evaporative heat transfer device pressure-regulating device automatically acts to maintain an adjustable, substantially constant pressure, which also effectively maintains the internal temperature, at a substantially constant, sub-ambient value;

ak. leading the super-heated vapor of said homogeneous vapor leaving said shrd hsfc-sfc evaporative heat transfer device pressure-regulating device to said cfc sub-ambient pressure generating device;

al. entering said cfc sub-ambient pressure generating device via said cspgd suction flow inlet, to supply working fluid in vapor form, to said cfc sub-ambient pressure generating device, thus reuniting said greater stream with said lesser stream;

am. interposing said cfc super-ambient temperature heat source and said sfc sub-ambient temperature heat sink, said incorporated heat engine flow circuit receives a sustained heat flow from the heat source, driven by the temperature differential between the heat source and the heat sink;

an. converting a portion of said sustained heat flow, by utilizing devices such as a pressure expanding device or a thermoelectric device, said incorporated heat engine flow circuit, produces useable mechanical energy and/or electrical energy;

ao. rejecting unused waste heat to said sfc sub-ambient temperature heat sink, returning an ihefc working fluid to its initial conditions and starting point, thus said incorporated heat engine flow circuit completes its thermodynamic cycle, and much of that portion of said sustained heat flow that is not converted to useable mechanical energy and/or electrical energy is captured, and is then returned to said cfc super-ambient temperature heat source, for reuse;

ap. utilizing the mechanical energy produced by said incorporated heat engine flow circuit, a mechanical load, or loads, is/are driven directly or indirectly via a mechanical output device to perform useful mechanical work, and/or the generation of electrical energy;

aq. flowing, an hrfc working fluid enters an hrfc ventilation motive device, wherein its velocity is increased;

ar. leading said hrfc working fluid leaving said hrfc ventilation motive device to an hrfc machinery space, and the working fluid is contained within said machinery space by a hermetic envelope formed by the thermally-insulated exterior surfaces of the machinery space;

as. absorbing heat, at substantially constant pressure, said hrfc working fluid captures much of the heat that leaks from a warm exterior surfaces of said motive flow circuit, said conjoined flow circuit, said suction flow circuit, said incorporated heat engine flow circuit, said mechanical output device, said heat recovery flow circuit, and said heat source flow circuit;

at. having absorbed heat, that portion of said hrfc working fluid in close contact with said warm exterior surfaces experiences a decrease in density, thus producing a buoyant force, causing the working fluid to rise toward the ceiling of said hrfc machinery space;

au. collecting the warmed fluid of said hrfc working fluid near the ceiling of said hrfc machinery space an hcdd working fluid inlet leads the working fluid, to one, or more, channels, of an hcdd distribution device;

av. distributing an hcdd working fluid, said hcdd distribution device leads said hcdd working fluid, to one, or more, heat generating devices in said hrfc machinery space that require a cooling medium to remain within allowable operating temperature limits;

aw. absorbing heat, said hcdd working fluid captures much of the waste heat that leaks out of said heat generating devices in said hrfc machinery space;

ax. having absorbed heat while in close contact with said heat generating devices in said hrfc machinery space, said hcdd working fluid experiences a decrease in density, thus producing a buoyant force, causing the working fluid to rise to the upper regions of said hrfc machinery space via an hcdd machinery cooling exhaust collection device;

ay. entering an hrfc heat recycling heat transfer device, said hrfc working fluid rejects heat, via an indirect heat transfer device, to an hhrhtd working fluid;

az. leading the substantially cooled fluid of said hrfc working fluid leaving said hrfc heat recycling heat transfer device to the inlet of said hrfc

ventilation motive device, thus returning said hrfc working fluid to its point of origin;

ba. absorbing heat from said hrfc working fluid flowing through an hhrhtd hrfc-hsfc heat recycling evaporative heat transfer device of an hrfc heat recycling heat transfer device, at substantially constant temperature, said hhrhtd working fluid evaporates to produce a vapor;

bb. leading said vapor leaving said hhrhtd hrfc-hsfc heat recycling evaporative heat transfer device to an hhrhtd hrfc-hsfc heat recycling condensing heat transfer device;

bc. condensing in an hhrhtd heat recycling condensing heat transfer device, said vapor rejects its latent heat of vaporization to said heat source flow circuit;

bd. draining out of said hhrhtd heat recycling condensing heat transfer device, the condensed liquid component of said hhrhtd working fluid collects in an hhrhtd working fluid storage device;

be. leading said hhrhtd working fluid leaving said hhrhtd working fluid storage device to said hhrhtd hrfc-hsfc heat recycling evaporative heat transfer device, thus returning said hhrhtd working fluid to its point of origin;

bf. flowing, an hsfc working fluid enters an hsfc fluid transfer device;

bg. pressurizing, at substantially constant entropy, said hsfc working fluid has both its pressure and temperature elevated, thus increasing the specific enthalpy of the working fluid in said heat source flow circuit;

bh. leading said hsfc working fluid leaving said hsfc fluid transfer device to an hsfc fluid filtering device;

bi. filtering, said hsfc working fluid has suspended particulate matter removed as it flows through said hsfc fluid filtering device;

bj. leading said hsfc working fluid leaving said hsfc fluid filtering device to an hsfc fluid import/export device;

bk. flowing through said hsfc fluid import/export device, the quantity of working fluid in said heat source flow circuit may be adjusted;

bl. leading said hsfc working fluid leaving said hsfc fluid import/export device to an hsfc heat source heat transfer device;

bm. absorbing heat, while simultaneously, at substantially constant entropy, experiencing a decrease in pressure and an increase in temperature, said hsfc working fluid extracts replenishment heat, from one, or more, external heat sources, via one, or more, indirect heat transfer devices within said hsfc heat source heat transfer device;

bn. leading said hsfc working fluid leaving said hsfc heat source heat transfer device to an hsfc sfc-hsfc heat recycling heat transfer device;

bo. absorbing heat, while simultaneously, at substantially constant entropy, experiencing a decrease in pressure and an increase in temperature, said hsfc working fluid extracts excess sensible heat from said sfc working fluid flowing through said sfc sfc-hsfc heat recycling heat transfer device, via one, or more, indirect heat transfer devices within said hsfc sfc-hsfc heat recycling heat transfer device;

bp. leading said hsfc working fluid leaving said hsfc sfc-hsfc heat recycling heat transfer device to an hsfc hrfc-hsfc heat recycling heat transfer device;

bq. absorbing heat, while simultaneously, at substantially constant entropy, experiencing a decrease in pressure and an increase in temperature, said hsfc working fluid extracts latent heat from said hhrhtd working fluid flowing through said hhrhtd hrfc-hsfc heat recycling condensing heat transfer device, via one, or more, indirect heat transfer devices within said hhrhtd hrfc-hsfc heat recycling condensing heat transfer device;

br. leading said hsfc working fluid leaving said hsfc hrfc-hsfc heat recycling heat transfer device to an hsfc hsfc-sfc super-heat heat transfer device;

bs. rejecting heat, while simultaneously, at substantially constant entropy, experiencing a decrease in pressure and a decrease in temperature, said hsfc working fluid supplies super-heat to said lesser stream flowing through said shrd hsfc-sfc super-heat heat transfer device, via one, or more indirect heat transfer devices within said hsfc hsfc-sfc super-heat heat transfer device;

bt. leading said hsfc working fluid leaving said hsfc hsfc-sfc super-heat heat transfer device to an hsfc hsfc-sfc evaporative heat transfer device;

bu. rejecting heat, while simultaneously, at substantially constant entropy, experiencing a decrease in pressure and a decrease in temperature, said hsfc working fluid supplies latent heat to said secondary liquid component flowing through said hsfc hsfc-sfc evaporative heat transfer device, via

one, or more indirect heat transfer devices within said hsfc hsfc-sfc evaporative heat transfer device;

bv. leading said hsfc working fluid leaving said hsfc hfsc-sfc evaporative heat transfer device to an hsfc hsfc-sfc evaporative heat transfer device working fluid discharge temperature-regulating device;

bw. regulating the discharge temperature of said hsfc working fluid leaving said hsfc hsfc-sfc evaporative heat transfer device, said hsfc hsfc-sfc evaporative heat transfer device working fluid discharge temperature-regulating device automatically acts to maintain an adjustable, substantially constant temperature, which also effectively regulates the fluid flow rate within said heat source flow circuit;

bx. leading said hsfc working fluid leaving said hsfc hsfc-sfc evaporative heat transfer device working fluid discharge temperature-regulating device to an hsfc fluid return device;

by. flowing through said hsfc fluid return device said hsfc working fluid receives any working fluid that may be released by an hssd overpressure relief device, should an overpressure condition warrant such action, said hssd overpressure relief device is interposed between said hsfc fluid import/export device and said hsfc fluid return device; and

bz. leading said hsfc working fluid leaving said hsfc fluid return device to said hsfc fluid transfer device, thus returning said hsfc working fluid to its point of origin, whereby a substantial portion of the replenishment heat extracted from an external environmental heat source, or sources, is

converted to useable mechanical energy and/or electrical energy, without utilizing an external heat sink, and heat loss is reduced to a minimum due to the substantial portion of waste heat that is recycled by this invention;

9. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

j1. leading said greater stream leaving said cspgd motive flow inlet to a cspgd suction chamber, via a cspgd convergent nozzle, said greater stream will xpand, at substantially constant entropy, thus converting a portion of the specific enthalpy of said greater stream to kinetic energy, and thereby accelerate said greater stream to a substantially higher velocity;

j2. entraining a portion of a primary vapor volume found within said cspgd suction chamber, a higher velocity greater stream removes said portion of a primary vapor volume from said cspgd suction chamber, at a point common to said conjoined flow circuit, said motive flow circuit, and said suction flow circuit, thereby generating a region of sub-ambient pressure, thus drawing replacement vapor into the suction chamber via a cspgd suction flow inlet;

j3. exiting said cspgd suction chamber via a cspgd conjoined flow discharge, said higher velocity greater stream and said portion of a primary vapor volume thus entrained, thoroughly mix together, thereby producing a primary saturated mixture;

j4. slowing in said cspgd conjoined flow discharge, said primary saturated mixture compresses, at substantially constant entropy, to produce a super-

ambient temperature, super-ambient pressure liquid, as the vapor portion of said primary saturated mixture distributes much of its latent heat of vaporization, to the liquid portion of said primary saturated mixture and condenses therein, thus said cfc sub-ambient pressure generating device combines an mfc working fluid liquid flow with an sfc working fluid vapor flow to produce a cfc working fluid liquid flow, or low quality saturated mixture flow, heated effluent;

10. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

i. entering said cfc sub-ambient pressure generating device via a cspgd motive flow inlet, such that said greater stream swirls in said cspgd motive flow inlet;

j1. leading said greater stream leaving said cspgd motive flow inlet to a cspgd suction chamber, at a point common to said conjoined flow circuit, said motive flow circuit, and said suction flow circuit, via a cspgd convergent-divergent nozzle, while traversing the centerline of the convergent portion of said cspgd convergent-divergent nozzle, conservation of angular momentum will impart a substantially greater angular velocity to said greater stream, simultaneously, said greater stream will expand, at substantially constant entropy, upon entering the divergent portion of the nozzle, decreasing centripetal force will allow the pressure of said greater stream to fall below its saturation point, resulting in a portion of the liquid of said greater stream flashing into vapor, to produce a saturated mixture,

at a substantially reduced temperature, thus converting a portion of the specific enthalpy of said greater stream to kinetic energy, and thereby accelerate said greater stream to a substantially higher velocity;

j2. entraining a portion of a primary vapor volume found within said cspgd suction chamber, a higher velocity greater stream removes said portion of a primary vapor volume from said cspgd suction chamber, at a point common to said conjoined flow circuit, said motive flow circuit, and said suction flow circuit, thereby generating a region of sub-ambient pressure, thus drawing replacement vapor into the suction chamber via a cspgd suction flow inlet;

j3. exiting said cspgd suction chamber via a cspgd conjoined flow discharge, said higher velocity greater stream and said portion of a primary vapor volume thus entrained, thoroughly mix together, thereby producing a primary saturated mixture;

j4. slowing in said cspgd conjoined flow discharge, said primary saturated mixture compresses, at substantially constant entropy, to produce a super-ambient temperature, super-ambient pressure liquid, as the vapor portion of said primary saturated mixture distributes much of its latent heat of vaporization, to the liquid portion of said primary saturated mixture and condenses therein, thus said cfc sub-ambient pressure generating device combines an mfc working fluid liquid flow with an sfc working fluid vapor flow to produce a cfc working fluid liquid flow, or low quality saturated mixture flow, heated effluent;

11. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

j1. leading said greater stream leaving said cspgd motive flow inlet to a cspgd suction chamber, at a point common to said conjoined flow circuit, said motive flow circuit, and said suction flow circuit, via a cspgd fluid transfer device and a cspgd convergent-divergent nozzle combination, said cspgd fluid transfer device accelerates said greater stream to higher traversing and angular velocities, via an impeller, an archimedes' screw, a propeller, or similar propulsive means rotating at a high angular velocity about a central axis, and discharges the swirling higher velocity liquid of said greater stream, without diffusion, into said cspgd convergent-divergent nozzle, while traversing the convergent portion of said cspgd convergent-divergent nozzle, conservation of angular momentum will impart a substantially greater angular velocity to said greater stream as it travels along the nozzle's centerline, simultaneously, said greater stream will expand, at substantially constant entropy, upon entering the divergent portion of the nozzle, decreasing centripetal force will allow the pressure of said greater stream to fall below its saturation point, resulting in a portion of the liquid of said greater stream flashing into vapor, to produce a saturated mixture at a substantially reduced temperature, thus converting a portion of the specific enthalpy of said greater stream to kinetic energy, and thereby accelerate said greater stream to a substantially higher velocity;

j2. entraining a portion of a primary vapor volume found within said cspgd suction chamber, a higher velocity greater stream removes said portion of a primary vapor volume from said cspgd suction chamber, at a point common to said conjoined flow circuit, said motive flow circuit, and said suction flow circuit, thereby generating a region of sub-ambient pressure, thus drawing replacement vapor into the suction chamber via a cspgd suction flow inlet;

j3. exiting said cspgd suction chamber via a cspgd conjoined flow discharge, said higher velocity greater stream and said portion of a primary vapor volume thus entrained, thoroughly mix together, thereby producing a primary saturated mixture;

j4. slowing in said cspgd conjoined flow discharge, said primary saturated mixture compresses, at substantially constant entropy, to produce a super-ambient temperature, super-ambient pressure liquid, as the vapor portion of said primary saturated mixture distributes much of its latent heat of vaporization, to the liquid portion of said primary saturated mixture and condenses therein, thus said cfc sub-ambient pressure generating device combines an mfc working fluid liquid flow with an sfc working fluid vapor flow to produce a cfc working fluid liquid flow, or low quality saturated mixture flow, heated effluent;

12. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

j1. leading said greater stream leaving said cspgd motive flow inlet to a cspgd conjoined flow discharge, via a cspgd hydraulic pressure expanding device, wherein the mechanical energy produced by said cspgd hydraulic pressure expanding device is utilized to drive a cspgd compressor;

j2. compressing within said cspgd compressor, at substantially constant entropy, vapor supplied by a cspgd suction flow inlet, has both its pressure and temperature increased substantially, and is then discharged into said cspgd conjoined flow discharge;

j3. combining, said greater stream discharged from said cspgd hydraulic pressure expanding device and the vapor discharged from said cspgd compressor, thoroughly mix together, thereby producing a primary saturated mixture;

j4. slowing in said cspgd conjoined flow discharge, said primary saturated mixture compresses, at substantially constant entropy, to produce a super-ambient temperature, super-ambient pressure liquid, as the vapor portion of said primary saturated mixture distributes much of its latent heat of vaporization, to the liquid portion of said primary saturated mixture and condenses therein, thus said cfc sub-ambient pressure generating device combines an mfc working fluid liquid flow with an sfc working fluid vapor flow to produce a cfc working fluid liquid flow, or low quality saturated mixture flow, heated effluent;

13. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

j1. leading said greater stream leaving said cspgd motive flow inlet to a cspgd conjoined flow discharge, via a cspgd convergent-divergent duct, wherein a region of sub-ambient pressure is generated as said greater stream flows through the throat of said cspgd convergent-divergent duct;

j2. drawing a continuous flow of vapor of said lesser stream to the throat of said cspgd convergent-divergent duct from said sfc shrd-cspgd vapor transfer device via a cspgd suction flow inlet;

j3. combining, said greater stream and the vapor supplied by said cspgd suction flow inlet, thoroughly mix together, thereby producing a primary saturated mixture;

j4. slowing in said cspgd conjoined flow discharge, said primary saturated mixture compresses, at substantially constant entropy, to produce a super-ambient temperature, super-ambient pressure liquid, as the vapor portion of said primary saturated mixture distributes much of its latent heat of vaporization, to the liquid portion of said primary saturated mixture and condenses therein, thus said cfc sub-ambient pressure generating device combines an mfc working fluid liquid flow with an sfc working fluid vapor flow to produce a cfc working fluid liquid flow, or low quality saturated mixture flow, heated effluent;

14. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

t1. leading said lesser stream leaving said ssftd sfc working fluid inlet to an ssftd suction chamber, via an ssftd convergent nozzle, said lesser stream will expand, at substantially constant entropy, thus converting a portion of the specific enthalpy of said lesser stream to kinetic energy, and thereby accelerate said lesser stream to a substantially higher velocity;

t2. entraining a portion of a primary liquid volume found within said ssftd suction chamber, a higher velocity lesser stream removes said portion of a primary liquid volume from said ssftd suction chamber, thereby generating a region of sub-ambient pressure, thus drawing replacement liquid into the suction chamber via said ssftd shrd excess working fluid inlet;

t3. exiting said ssftd suction chamber via said ssftd working fluid discharge, said higher velocity lesser stream and said portion of a primary liquid volume thus entrained, thoroughly mix together, thereby producing a secondary saturated mixture;

15. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

s. entering said sfc shrd-ssths fluid transfer device via said ssftd sfc working fluid inlet, such that said lesser stream swirls in said ssftd sfc working fluid inlet;

t1. leading said lesser stream leaving said ssftd sfc working fluid inlet to said ssftd suction chamber, via an ssftd convergent-divergent nozzle, while

traversing the centerline of the convergent portion of said ssftd convergent-divergent nozzle, conservation of angular momentum will impart a substantially greater angular velocity to said lesser stream, simultaneously, said lesser stream will expand, at substantially constant entropy, upon entering the divergent portion of the nozzle, decreasing centripetal force will allow the pressure of said lesser stream to fall below its saturation point, resulting in a portion of the liquid of said lesser stream flashing into vapor, to produce a saturated mixture, at a substantially reduced temperature, thus converting a portion of the specific enthalpy of said lesser stream to kinetic energy, and thereby accelerate said lesser stream to a substantially higher velocity;

t2. entraining a portion of a primary liquid volume found within said ssftd suction chamber, a higher velocity lesser stream removes said portion of a primary liquid volume from said ssftd suction chamber, thereby generating a region of sub-ambient pressure, thus drawing replacement liquid into the suction chamber via said ssftd shrd excess working fluid inlet;

t3. exiting said ssftd suction chamber via said ssftd working fluid discharge, said higher velocity lesser stream and said portion of a primary liquid volume thus entrained, thoroughly mix together, thereby producing a primary saturated mixture;

16. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

t1. leading said lesser stream leaving said ssftd sfc working fluid inlet to an ssftd suction chamber, via an ssftd fluid transfer device and an ssftd convergent-divergent nozzle combination, said ssftd fluid transfer device accelerates said greater stream to higher traversing and angular velocities, via an impeller, an archimedes' screw, a propeller, or similar fluid propulsive means, rotating at a high angular velocity about a central axis, and discharges the swirling higher velocity liquid of said lesser stream, without diffusion, into said ssftd convergent-divergent nozzle, while traversing the convergent portion of said ssftd convergent-divergent nozzle, conservation of angular momentum will impart a substantially greater angular velocity to said lesser stream as it travels along the nozzle's centerline, simultaneously, said lesser stream will expand, at substantially constant entropy, upon entering the divergent portion of the nozzle, decreasing centripetal force will allow the pressure of said lesser stream to fall below its saturation point, resulting in a portion of the liquid of said lesser stream flashing into vapor, to produce a saturated mixture, at a substantially reduced temperature, thus converting a portion of the specific enthalpy of said lesser stream to kinetic energy, and thereby accelerate said lesser stream to a substantially higher velocity;

t2. entraining a portion of a primary liquid volume found within said ssftd suction chamber, a higher velocity lesser stream removes said portion of a

primary liquid volume from said ssftd suction chamber, thereby generating a region of sub-ambient pressure, thus drawing replacement liquid into the suction chamber via said ssftd sfc working fluid inlet;

t3. exiting said ssftd suction chamber via said ssftd working fluid discharge, said higher velocity lesser stream and said portion of a primary liquid volume thus entrained, thoroughly mix together, thereby producing a primary saturated mixture;

17. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

t1. leading said lesser stream leaving said ssftd sfc working fluid inlet to an ssftd working fluid discharge, via an ssftd hydraulic pressure expanding device, wherein the mechanical energy produced by said ssftd hydraulic pressure expanding device is utilized to drive an ssftd fluid transfer device;

t2. pressurizing within said ssftd fluid transfer device, at substantially constant entropy, liquid supplied by said ssftd shrd excess working fluid inlet, has both its pressure and temperature increased substantially, and is then discharged into said ssftd working fluid discharge;

t3. combining, said lesser stream discharged from said ssftd hydraulic pressure expanding device and the liquid discharged from said ssftd fluid transfer device, thoroughly mix together, thereby producing a primary saturated mixture;

18. (NEW) A method according to claim 8, wherein the following alternative steps are utilized:

t1. leading said lesser stream leaving said ssftd sfc working fluid inlet to said ssftd working fluid discharge, via an ssftd convergent-divergent duct, wherein a region of sub-ambient pressure is generated as said lesser stream flows through the throat of said ssftd convergent-divergent duct;

t2. drawing a continuous flow of liquid of an shrd excess working fluid to the throat of said ssftd convergent-divergent duct from said ssftd shrd excess working fluid inlet;

t3. combining, said lesser stream and the liquid supplied by said ssftd shrd excess working fluid inlet, thoroughly mix together, and are discharged into a region of sub-ambient pressure, below the saturation point of said ssftd working fluid, thereby producing a primary saturated mixture;

19. (NEW) A method according to claim 8, wherein replenishment heat may be extracted from an external environmental heat source, or sources, whenever said external environmental heat source's temperature is marginally greater than the internal temperature of said sfc heat replenishment device;

20. (NEW) An apparatus for converting heat to useable mechanical energy and/or electrical energy by continuously and concurrently generating a super-ambient temperature heat source and a sub-ambient temperature heat sink, whose temperature differential is sufficient to develop and sustain a heat flow capable of fueling the operation of an incorporated heat engine, within a thermal power plant, one which recycles much of its own waste heat, without utilizing an

external heat sink, also said sub-ambient temperature heat sink captures for reuse much of the waste heat rejected by said incorporated heat engine, further said sub-ambient temperature heat sink has a temperature sufficiently low enough to extract replenishment heat from an external environmental heat source, or sources, sufficient to fuel the operation of said thermal power plant, comprising:

a. a cfc flow divider to divide the volatile liquid of a cfc working fluid, flowing in a conjoined flow circuit into two unequal streams, and directing a greater stream to a motive flow circuit and a lesser stream to a suction flow circuit, at an ambient conditions datum, a point located within a cfd flow separation chamber common to said conjoined flow circuit, said motive flow circuit, said suction flow circuit, and a cfd fluid import/export device which provides fluid communication between said conjoined flow circuit and a cfc safety/service device which is interposed between said cfd fluid import/export device and an sfc shrd-ssths fluid transfer device;

b. a conduit means to transport said greater stream leaving said cfc flow divider to an mfc fluid transfer device;

c. said mfc fluid transfer device to impart a super-ambient pressure to said greater stream, and enable said greater stream to flow to a region of sub-ambient pressure;

d. a conduit means to transport said greater stream leaving said mfc fluid transfer device to an mfc fluid filtering device;

e. said mfc fluid filtering device to remove suspended particulate matter from said greater stream as the stream passes through the filtering device;

f. a conduit means to transport said greater stream leaving said mfc fluid filtering device to an mfc fluid flow-regulating device;

g. said mfc fluid flow-regulating device to adjustably, automatically, control the flow rate of said greater stream in said motive flow circuit;

h. a conduit means to transport said greater stream leaving said mfc fluid flow-regulating device to a cfc sub-ambient pressure generating device;

i. said cfc sub-ambient pressure generating device to generate a region of sub-ambient pressure, to enable the complete evaporation of the liquid supplied to said lesser stream, at a temperature marginally above the freezing point of a shrd working fluid, and to subsequently compress the vapor produced, at substantially constant entropy, thus reforming the liquid flow, or low quality saturated mixture flow, of said cfc working fluid at a super-ambient pressure and a super-ambient temperature, to produce a heated effluent;

j. a conduit means to transport said heated effluent leaving said cfc sub-ambient pressure generating device to a cfc super-ambient temperature heat source;

k. said cfc super-ambient temperature heat source to supply heat to an incorporated heat engine flow circuit, via one, or more, indirect heat transfer devices located within the heat source, thus substantially cooling said cfc working fluid as it flows through the heat source;

l. a conduit means to transport said cfc working fluid leaving said cfc super-ambient temperature heat source to said cfc flow divider, thus returning

said cfc working fluid, at ambient pressure and ambient temperature, to said ambient conditions datum;

m. a conduit means to transport said lesser stream leaving said cfc flow divider to an sfc fluid flow-regulating device;

n. said sfc fluid flow-regulating device to adjustably, automatically, control the flow rate of said lesser stream in said suction flow circuit;

o. a conduit means to transport said lesser stream leaving said sfc fluid flow-regulating device to an sfc sfc-hsfc heat recycling heat transfer device;

p. said sfc sfc-hsfc heat recycling heat transfer device to enable said lesser stream to reject excess sensible heat to a heat source flow circuit, via one, or more, indirect heat transfer devices located within said sfc sfc-hsfc heat recycling heat transfer device;

q. a conduit means to transport said lesser stream leaving said sfc sfc-hsfc heat recycling heat transfer device to said sfc shrd-ssths fluid transfer device;

r. said sfc shrd-ssths fluid transfer device to generate a region of sub-ambient pressure, to enable extraction of excess working fluid transported to an sfc heat replenishment device, and to produce a secondary saturated mixture;

s. a conduit means to transport said said secondary saturated mixture leaving said sfc shrd-ssths fluid transfer device to an sfc sub-ambient temperature heat sink;

t. an ssths ihefc-sfc evaporative heat transfer device of said sfc sub-ambient temperature heat sink to receive the substantial amounts of waste heat rejected by said incorporated heat engine flow circuit, by converting a portion of the liquid of said secondary saturated mixture to vapor, thus enabling said incorporated heat engine flow circuit to complete its thermodynamic cycle;

u. an ssths liquid/vapor separation device to separate said secondary saturated mixture leaving said ssths ihefc-sfc evaporative heat transfer device of said sfc sub-ambient temperature heat sink into a secondary liquid component and a secondary vapor component, and directing said secondary liquid component to an shrd hsfc-sfc evaporative heat transfer device ssths liquid supply device and said secondary vapor component to an ssths ihefc-sfc evaporative heat transfer device pressure-regulating device;

v. said ssths ihefc-sfc evaporative heat transfer device pressure-regulating device to adjustably, automatically, control the internal pressure of said ssths ihefc-sfc evaporative heat transfer device, and simultaneously regulate the internal temperature of the heat transfer device, at a substantially constant, sub-ambient value;

w. an shrd hsfc-sfc evaporative heat transfer device ssths vapor supply device to transport said secondary vapor component leaving said ssths evaporative heat transfer device pressure-regulating device to said sfc heat

replenishment device, to a point upstream of an shrd liquid/vapor separation device;

x. an shrd hsfc-sfc evaporative heat transfer device ssths liquid supply device to transport said secondary liquid component leaving said ssths liquid/vapor separation device to said sfc heat replenishment device;

y. an shrd hsfc-sfc evaporative heat transfer device of said sfc heat replenishment device to convert a portion of the liquid supplied by said shrd hsfc-sfc evaporative heat transfer device liquid supply device to vapor, and simultaneously, substantially cooling an hsfc working fluid discharged from said hsfc hsfc-sfc super-heat heat transfer device;

z. an shrd liquid/vapor separation device to separate a tertiary saturated mixture leaving said shrd hsfc-sfc evaporative heat transfer device of said sfc heat replenishment device into a tertiary liquid component and a tertiary vapor component, and directing excess liquid of said tertiary liquid component to said sfc shrd-ssths fluid transfer device and said tertiary vapor component to said shrd hsfc-sfc super-heat heat transfer device, combining with said tertiary saturated mixture prior to its passing through said shrd liquid/vapor separation device is said secondary vapor component supplied by said shrd hsfc-sfc evaporative heat transfer device ssths vapor supply device, thus increasing the proportion of vapor that is discharged from the separation device;

aa. said shrd hsfc-sfc super-heat heat transfer device to supply super-heat to a homogenous vapor formed by the thorough mixing together of said

secondary vapor component and said tertiary vapor component, while simultaneously, substantially cooling said hsfc working fluid flowing through said hsfc hsfc-sfc super-heat heat transfer device;

ab. an shrd hsfc-sfc evaporative heat transfer device pressure-regulating device to adjustably, automatically, control the internal pressure of said shrd hsfc-sfc evaporative heat transfer device, and simultaneously regulate the internal temperature of the heat transfer device, at a substantially constant, sub-ambient value;

ac. an sfc shrd-cspgd vapor transfer device to transport the super-heated vapor discharged from said shrd hsfc-sfc evaporative heat transfer device pressure-regulating device to said cfc sub-ambient pressure generating device;

ad. a conduit means to transport the excess liquid of said tertiary liquid component leaving said sfc heat replenishment device to said sfc shrd-ssths fluid transfer device;

ae. said incorporated heat engine flow circuit to receive a useable heat flow from said cfc super-ambient temperature heat source, to convert a portion of said useable heat flow to useable mechanical energy and/or electrical energy, and to reject much of the unused waste heat to said sfc sub-ambient temperature heat sink, for subsequent reuse;

af. a mechanical output device to conduct the mechanical energy produced by a thermal energy to mechanical energy conversion device of said incorporated heat engine flow circuit, from the interior of the flow circuit,

to a mod driven mechanical device located outside of the flow circuit and inside of an hrfc machinery space;

ag. an hrfc ventilation motive device to impart a flow to an hrfc working fluid;

ah. said hrfc machinery space to enclose some of the elements of a thermal power plant, and to form a thermally-insulated, hermetic envelope surrounding the enclosed elements of said thermal power plant;

ai. an hms cooling distribution device to capture the heat that leaks from, and/or is rejected by, the elements enclosed within said hrfc machinery space, and lead the heated fluid of an hcdd working fluid to an hrfc heat recycling heat transfer device;

aj. said hrfc heat recycling heat transfer device to extract heat from said hcdd working fluid flowing through said hrfc heat recycling heat transfer device, and to supply the extracted heat to an hhrhtd hrfc-hsfc heat recycling evaporative heat transfer device, to evaporate an hhrhtd working fluid;

ak. a conduit means to transport the vapor produced in said hhrhtd hrfc-hsfc heat recycling heat transfer device to an hhrhtd heat recycling condensing heat transfer device;

al. said hhrhtd heat recycling condensing heat transfer device to remove the latent heat of vaporization of the vapor of said hhrhtd working fluid, and to supply the removed heat to said hsfc working fluid flowing through said hsfc hrfc-hsfc heat recycling heat transfer device;

am. a conduit means to transport the condensate produced in said hhrhtd heat recycling heat transfer device to an hhrhtd working fluid storage device;

an. said hhrhtd working fluid storage device to store a liquid volume of said hhrhtd working fluid;

ao. a conduit means to transport said hhrhtd working fluid leaving said hhrhtd working fluid storage device to said hhrhtd heat recycling evaporative heat transfer device;

ap. an hsfc fluid transfer device to impart a flow to said hsfc working fluid flowing in said heat source flow circuit;

aq. a conduit means to transport said hsfc working fluid leaving said hsfc fluid transfer device to an hsfc fluid filtering device;

ar. said hsfc fluid filtering device to remove suspended particulate matter from said hsfc working fluid as it flows through the filtering device;

as. a conduit means to transport said hsfc working fluid leaving said hsfc fluid filtering device to an hsfc fluid import/export device;

at. said hsfc fluid import/export device to enable the quantity of said hsfc working fluid flowing in said heat source flow circuit to be adjusted, said hsfc fluid import/export device provides fluid communication between said heat source flow circuit and an hsfc safety/service device, which is interposed between said hsfc fluid import/export device and an hsfc fluid return device;

au. a conduit means to transport said hsfc working fluid leaving said hsfc fluid import/export device to an hsfc heat source heat transfer device;

av. said hsfc heat source heat transfer device to extract replenishment heat from an external environmental heat source, or sources;

aw. a conduit means to transport said hsfc working fluid leaving said hsfc heat source heat transfer device to an hsfc sfc-hsfc heat recycling heat transfer device;

ax. said hsfc sfc-hsfc heat recycling heat transfer device to enable said lesser stream flowing through said sfc sfc-hsfc heat recycling heat transfer device to cool substantially, by rejecting excess sensible heat to said hsfc working fluid flowing through said hsfc sfc-hsfc heat recycling heat transfer device;

ay. a conduit means to transport said hsfc working fluid leaving said hsfc sfc-hsfc heat recycling heat transfer device to an hsfc hrfc-hsfc heat recycling heat transfer device;

az. said hsfc hrfc-hsfc heat recycling heat transfer device to extract the latent heat of vaporization of the vapor of said hhrhtd working fluid flowing through said hhrhtd hrfc-hsfc heat recycling condensing heat transfer device;

ba. a conduit means to transport said hsfc working fluid leaving said hsfc hrfc-hsfc heat recycling heat transfer means to an hsfc hsfc-sfc super-heat heat transfer device;

bb. said hsfc hsfc-sfc super-heat heat transfer device to supply super-heat to said homogenous vapor formed within said sfc heat replenishment device;

bc. a conduit means to transport said hsfc working fluid leaving said hsfc hsfc-sfc super-heat heat transfer device to an hsfc hsfc-sfc evaporative heat transfer device;

bd. said hsfc hsfc-sfc evaporative heat transfer device to supply latent heat to said secondary liquid component flowing through said shrd hsfc-sfc evaporative heat transfer device;

be. a conduit means to transport said hsfc working fluid leaving said hsfc hfc-sfc evaporative heat transfer device to an hsfc hsfc-sfc evaporative heat transfer device working fluid discharge temperature-regulating device;

bf. said hsfc hsfc-sfc evaporative heat transfer device working fluid discharge temperature-regulating device to adjustably, automatically, control the temperature of said hsfc working fluid leaving the temperature-regulating device, which effectively regulates the flow of said hsfc working fluid in said heat source flow circuit;

bg. a conduit means to transport said hsfc working fluid leaving said hsfc hsfc-sfc evaporative heat transfer device working fluid discharge temperature-regulating device to said hsfc fluid return device;

bh. said hsfc fluid return device to enable an hssd working fluid to enter said heat source flow circuit should conditions warrant the release of said hssd working fluid by an hssd overpressure relief device; and

bi. a conduit means to transport said hsfc working fluid leaving said hsfc fluid return device to said hsfc fluid transfer device, whereby a substantial portion of the replenishment heat extracted from an external

environmental heat source, or sources, is converted to useable mechanical energy and/or electrical energy, without utilizing an external heat sink, and heat loss is reduced to a minimum due to the substantial portion of waste heat that is recycled by this invention;

21. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

i1. a cspgd convergent nozzle to accelerate said greater stream to a higher velocity fluid;

i2. a cspgd suction chamber where vapor supplied by said lesser stream is entrained by said higher velocity fluid of said greater stream discharged from said cspgd convergent nozzle, thereby generating a region of sub-ambient pressure;

i3. a cspgd conjoined flow discharge to promote thorough mixing of the working fluids supplied by said greater stream and said lesser stream, and to diffuse a resultant mixture, to produce a heated effluent, at a super-ambient pressure and a super-ambient temperature;

22. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

i1. a cspgd motive flow inlet which promotes swirling by said greater stream as it is admitted to said cfc sub-ambient pressure generating device;

i2. a cspgd convergent-divergent nozzle to accelerate said greater stream to a higher velocity fluid;

i3. a cspgd suction chamber where vapor supplied by said lesser stream is entrained by said higher velocity fluid of said greater stream discharged from said cspgd convergent-divergent nozzle, thereby generating a region of sub-ambient pressure;

i4. a cspgd conjoined flow discharge to promote thorough mixing of the working fluids supplied by said greater stream and said lesser stream, and to diffuse a resultant mixture, to produce a heated effluent, at a super-ambient pressure and a super-ambient temperature;

23. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

i1. a cspgd fluid transfer device to impart a flow and a swirl to said greater stream;

i2. a cspgd convergent-divergent nozzle to accelerate said greater stream to a higher velocity fluid;

i3. a cspgd suction chamber where vapor supplied by said lesser stream is entrained by said higher velocity fluid of said greater stream discharged from said cspgd convergent-divergent nozzle, thereby generating a region of sub-ambient pressure;

i4. a cspgd conjoined flow discharge to promote thorough mixing of the working fluids supplied by said greater stream and said lesser stream, and to diffuse a resultant mixture, to produce a heated effluent, at a super-ambient pressure and a super-ambient temperature;

24. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

i1. a cspgd hydraulic pressure expanding device to utilize the pressure energy of said greater stream to generate mechanical energy to drive a cspgd compressor;

i2. a cspgd compressor to generate a region of sub-ambient pressure, and to discharge said lesser stream at a super-ambient pressure;

i3. a cspgd conjoined flow discharge to promote thorough mixing of the working fluids supplied by said greater stream and said lesser stream, and to diffuse a resultant mixture, to produce a heated effluent, at a super-ambient pressure and a super-ambient temperature;

25. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

i1. a convergent portion of a cspgd convergent-divergent duct to accelerate said greater stream to a higher velocity fluid in a cspgd throat of said cspgd convergent-divergent duct, thereby generating a region of sub-ambient pressure, to draw a continual stream of vapor from said lesser stream to said cspgd throat;

i2. said cspgd throat of said cspgd convergent-divergent duct to promote thorough mixing of the working fluids supplied by said greater stream and said lesser stream, said lesser stream having been entrained by said higher velocity fluid of said greater stream;

i3. a divergent portion of said cspgd convergent-divergent duct to diffuse a resultant mixture, to produce a heated effluent, at a super-ambient pressure and a super-ambient temperature;

26. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

r1. an ssftd convergent nozzle to accelerate said lesser stream to a higher velocity fluid;

r2. an ssftd suction chamber where liquid supplied by an sfc shrd-ssftd excess tertiary liquid component transfer device is entrained by said higher velocity fluid of said lesser stream discharged from said ssftd convergent nozzle, thereby generating a region of sub-ambient pressure;

r3. an ssftd working fluid discharge to promote thorough mixing of the working fluids supplied by said lesser stream and said sfc shrd-ssftd excess tertiary liquid component transfer device, and to diffuse a resultant mixture, to produce said secondary saturated mixture at a sub-ambient pressure, and a temperature marginally above the freezing point of said resultant mixture;

27. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

r1. an ssftd sfc working fluid inlet, which promotes swirling by said lesser stream as it, is admitted to said sfc sfc-ssths fluid transfer device;

r2. an ssftd convergent-divergent nozzle to accelerate said lesser stream to a higher velocity fluid;

r3. an ssftd suction chamber where liquid supplied by said sfc shrd-ssftd excess tertiary liquid component transfer device is entrained by said higher velocity fluid of said lesser stream discharged from said ssftd convergent-divergent nozzle, thereby generating a region of sub-ambient pressure;

r4. an ssftd working fluid discharge to promote thorough mixing of the working fluids supplied by said lesser stream and said sfc shrd-ssftd excess tertiary liquid component transfer device, and to diffuse a resultant mixture, to produce said secondary saturated mixture at a sub-ambient pressure, and a temperature marginally above the freezing point of said resultant mixture;

28. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

r1. an ssftd fluid transfer device to impart a flow and a swirl to said lesser stream;

r2. an ssftd convergent-divergent nozzle to accelerate said lesser stream to a higher velocity fluid;

r3. an ssftd suction chamber where liquid supplied by said sfc shrd-ssths is entrained by said higher velocity fluid of said lesser stream discharged from said ssftd convergent-divergent nozzle, thereby generating a region of sub-ambient pressure;

r4. an ssftd working fluid discharge to promote thorough mixing of the working fluids supplied by said lesser stream and said sfc shrd-ssftd excess tertiary liquid component transfer device, and to diffuse a resultant

mixture, to produce said secondary saturated mixture at a sub-ambient pressure, and a temperature marginally above the freezing point of said resultant mixture;

29. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

r1. an ssftd hydraulic pressure expanding device to utilize the pressure energy of said lesser stream to generate mechanical energy to drive an ssftd fluid transfer device;

r2. an ssftd fluid transfer device to generate a region of sub-ambient pressure, and to discharge the liquid supplied by said sfc shrd-ssftd excess tertiary liquid component transfer device, at an elevated sub-ambient pressure;

r3. an ssftd working fluid discharge to promote thorough mixing of the working fluids supplied by said lesser stream and said sfc shrd-ssftd excess tertiary liquid component transfer device, and to diffuse a resultant mixture, to produce said secondary saturated mixture at a sub-ambient pressure, and a temperature marginally above the freezing point of said resultant mixture;

30. (NEW) An apparatus according to claim 20, wherein the following alternative elements are utilized:

r1. a convergent portion of an ssftd convergent-divergent duct to accelerate said lesser stream to a higher velocity fluid in an ssftd throat of said ssftd convergent-divergent duct, thereby generating a region of sub-ambient

pressure, to draw a continual stream of liquid from said sfc shrd-ssftd excess tertiary liquid component transfer device to said ssftd throat;

r2. said ssftd throat of said ssftd convergent-divergent duct to promote thorough mixing of the working fluids supplied by said lesser stream and said sfc shrd-ssftd excess tertiary liquid component transfer device, the liquid supplied by said sfc shrd-ssftd excess tertiary component having been entrained by said higher velocity fluid of said lesser stream;

r3. a divergent portion of said ssftd convergent-divergent duct to diffuse a resultant mixture, to produce said secondary saturated mixture at a sub-ambient pressure, and a temperature marginally above the freezing point of said resultant mixture;

31. (NEW) An apparatus according to claim 20, wherein replenishment heat is extracted from an external environmental heat source, or sources, whose temperature is marginally greater than the internal temperature of said sfc heat replenishment device;